**TECHNICAL REVIEW DOCUMENT**
**For**
**RENEWAL of OPERATING PERMIT 95OPMF040**

Questar Gas Management Company, East Hiawatha Compressor Station
Moffat County
Source ID 0810076

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Revised January and March 2004

## I. Purpose:

This document will establish the basis for decisions made regarding the applicable requirements, emission factors, monitoring plan and compliance status of emission units covered by the renewed operating permit proposed for this site. The original Operating Permit was issued February 1, 1998, with an expiration date of February 1, 2003. This document is designed for reference during the review of the proposed permit by the EPA, the public, and other interested parties. The conclusions made in this report are based on information provided in the renewal application submitted January 31, 2002, comments on the draft permit and technical review document received on March 26, 2004, previous inspection reports and various e-mail correspondence, as well as telephone conversations with the applicant. Please note that copies of the Technical Review Document for the original permit and any Technical Review Documents associated with subsequent modifications of the original Operating Permit may be found in the Division files as well as on the Division website at http://www.cdphe.state.co.us/ap/Titlev.html.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised construction permit.

## II. Description of Source

This source is classified as a natural gas compressor station and is classified under Standard Industrial Classification 4922. Gas is compressed to specification for transmission to a primary pipeline using three internal combustion engines to power compressor units. The natural gas is processed through a glycol dehydration system to remove moisture. Combustion engines are also used to power a 60 KW generator

which provides electricity to the plant. The facility also has methanol and condensate storage tanks. Methanol is injected into the gas stream prior to compression to prevent formation of water hydrates. Condensates are separated from the incoming gas stream using a series of separation and scrubbing vessels.

The facility is located in Moffat County approximately 70 miles northwest of Craig, CO, in an area which is designated as attainment for all criteria pollutants.

Wyoming and Utah are within a 50 mile radius of this station and are therefore considered affected states. There are no federal Class I designated areas within 100 kilometers of the plant. Dinosaur National Monument is federal land within 100 kilometers of the facility. This area has been designated by the State to have the same sulfur dioxide increment as federal Class I designated areas.

Based on the information available to the Division and provided by the applicant, it appears that no modifications to the significant emission units have occurred since the original issuance of the operating permit.

In addition, the source did not identify any changes to the insignificant activity list. However, it should be noted that revisions were made to Colorado Regulation No. 3, regarding condensate storage tanks and condensate truck loading equipment and those revisions took effect on December 30, 2002. Previously, under Regulation No. 3, certain size condensate storage tanks and condensate truck loading equipment meeting a specified throughput limit were exempt from APEN reporting and permitting requirements and were considered insignificant activities for Title V operating permit purposes. With the revisions to Colorado Regulation No. 3, only condensate storage tanks and condensate truck loading equipment at exploration and production (E & P) sites, meeting specified throughput limits are APEN exempt and insignificant activities. The insignificant activity list (Appendix A) in the current permit indicates that there is one condensate storage tank (16,800 gallons). The source submitted an APEN on April 30, 2003 indicating that emissions from the condensate storage tanks were above APEN de minimis levels. The APEN also indicated that there were three condensate storage tanks (each 400 bbl or 16,800 gallons) at the facility. Therefore, the condensate storage tanks can no longer be considered an insignificant activity and will be included in Section II of the permit. The source submitted information in their March 26, 2004 comments indicating that emissions from condensate loading equipment are below APEN de minimis levels. Therefore, condensate loading equipment has been identified in Appendix A as an insignificant activity.

Compliance Assurance Monitoring (CAM) Requirements

None of the significant emission units at this facility are equipped with control devices, therefore the Compliance Assurance Monitoring (CAM) requirements do not apply to any emission units at this facility.

MACT Requirements

The source submitted an initial notification on June 20, 2000 indicating that the facility was a major source for hazardous air pollutants (HAPS) and was potentially subject to the requirements in 40 CFR Part 63 Subpart HH (Oil and Natural Gas Production MACT). The source indicated in their initial notification that they were evaluating various control technologies for reduction of VOC from the dehydrator reboiler vent line and anticipated that installation of the control equipment would be complete prior to the June 17, 2002 deadline. The Division is not aware that any control equipment was installed on the glycol dehydrator

For purposes of 40 CFR Part 63 Subpart B §§ 63.50 thru 63.56 (112(j)), the source submitted a notification on May 15, 2002 indicating the facility was not a major source for HAPS.

Since the source has provided contradictory information regarding the facilities source status with respect to HAPS, the Division looked at HAP emissions for the facility during the review of the renewal application. Based on AP-42 emission factors for the engines, the APEN submitted April 24, 2002 for the dehydrator and the APEN submitted April 29, 2003 for the condensate tanks, the Division considers that the facility is a minor source for HAPS. It should be noted that 40 CFR Part 63 Subpart HH, does not require sources to determine major source status based on design rate for natural gas processing but allows sources to use a calculated maximum natural gas processing rate. However, if a source uses the calculated maximum natural gas processing rate, the source is required to retain records of the rate used in determining they are a minor source and to re-evaluate the source status if the actual gas processing rate exceeds the calculated maximum value. Since the APEN submitted for the dehydrator used the permitted natural gas throughput rate, the Division will not include the requirement to retain records of the maximum natural gas processing rate.

The summary of emissions that was presented in the Technical Review Document (TRD) for the original permit issuance has been modified to update the potential to emit (PTE) to address emissions from the condensate tanks and to reflect more recent actual emissions. Emissions (in tons per year) at the facility are as follows:

| Pollutant | Potential to Emit[1] | Actual Emissions |
|---|---|---|
| $NO_X$ | 238.8 | 173 |
| CO | 198.9 | 141.3 |
| VOC | 62.94 | 61.6 |
| HAPS | 17 | 15.21 |

[1]Note that for engines P301 and P302, since only one engine can run at one time, the PTE is based on one engine running 8760 hrs/yr.

Potential to emit is based on emission factors, design rate and 8760 hrs/yr for the engines, permitted emissions for the glycol dehydrator and requested emissions identified in the APEN for the condensate tanks. Actual emissions are based on APENs submitted on January 31, 2002 for the engines (data year 2001), April 24, 2002 for the dehydrator (potential emissions are reported as actual emissions) and April 29, 2003 (data year 2002) for the condensate tanks.

## III. Discussion of Modifications Made

**Source Requested Modifications**

The source's requested modifications identified in the renewal application were addressed as follows:

Section II, Condition 3 and 3.1

The source requested that the Division relax the frequency of conducting extended gas analyses, since the unit operates less frequently than it has in the past and the data gathered over the last permit term indicates that the BTEX levels do not vary significantly. The Division is willing to revise the frequency of sampling to annual but we would like to see the frequency increase if the BTEX levels vary in the future. Therefore, the Division has included the BTEX levels used in the April 24, 2002 APEN as threshold values. As long as the extended natural gas analyses indicates that the BTEX levels remain at or below the threshold values, the frequency of analysis will remain at annual. If the source would like to adjust the BTEX threshold values, a revised GLYCalc analysis that demonstrates compliance with the existing emission limit must be submitted or as an alternative the source can request an increase in the VOC emission limits based on the adjusted BTEX threshold values.

**Other Modifications**

In addition to the source requested modifications, the Division has included changes to make the permit more consistent with recently issued permits, include comments made by EPA on other Operating Permits, as well as correct errors or omissions identified during inspections and/or discrepancies identified during review of this renewal.

The Division has made the following revisions, based on recent internal permit processing decisions and EPA comments to the East Hiawatha Compressor Renewal Operating Permit. These changes are as follows:

Page Following Cover Page

- Clarified dates for monitoring and compliance periods, i.e. changed "February - July" to "February 1 – July 31".

  Monitoring and compliance periods and report and certification due dates are shown as examples. The appropriate monitoring and compliance periods and report and certification due dates will be filled in after permit issuance and will be based on permit issuance date. Note that the source may request to keep the same monitoring and compliance periods and report and certification due dates as were provided in the original permit. However, it should be noted that with this option, depending on the permit issuance date, the first monitoring period and compliance period may be short (i.e. less than 6 months and less than 1 year).

- The citation (above "issued to" and "plant site location") on the page following the cover page provides the incorrect title for the state act. The title will be changed from "Colorado Air Quality Control Act" to "Colorado Air Pollution Prevention and Control Act". In addition, the dates were removed from the citation.

- Changed Responsible Official and Permit Contact's title.

- Added language specifying that the semi-annual reports and compliance certifications are due in the Division's office and that postmarks cannot be used for purposes of determining the timely receipt of such reports/certifications.

Section I – General Activities and Summary

- The language in Condition 1.1 was revised to indicate that the methanol tank is included in the insignificant activity list and that the condensate tanks have been included in Section II of the permit.

- The language in Condition 1.1 was changed to update the facility description and to indicate that Dinosaur National Monument is within 100 km of this facility. Although Dinosaur National Monument is not a federal Class I designated area, this area has been designated by the State to have the same sulfur dioxide increment as federal Class I designated areas.

- Conditions 13 and 17 in Condition 1.4 were renumbered to 14 and 18 and Condition 21 in Condition 1.5 was renumbered to 22. The renumbering changes were necessary due to the addition of the Common Provisions requirements in the General Conditions of the permit. In addition, "as noted" was added after Condition 17 to reflect revisions made to Colorado Regulation No. 15.

- In Condition 1.4, General Condition 3.g (new general condition for general provisions) was added as a State-only requirement.

- Minor language changes were made to Condition 3 (PSD requirements).

- Based on comments made by EPA on another operating permit, the phrase "Based on the information provided by the applicant" was added to the beginning of Condition 4.1 (Accidental Release Prevention Program, 112(r)).

- Added a "new" Section 5 for compliance assurance monitoring (CAM), note that no emission units are subject to CAM.

Section II - Specific Permit Terms

Section II.1 – Units P101 – P103, Ingersoll Rand Engines

- Minor language changes were made to Condition 1.1 and an equation was included.

- Minor language changes were made to Condition 1.2.

- The opacity standard in Condition 1.3 and in the Table was rewritten to more closely resemble the language in Regulation No. 1. In addition, the word "credible" was added before "evidence".

- Under "monitoring interval" in the Table for Condition 1.3, replaced "annually" with "whenever natural gas is used as fuel".

- Removed Condition 1.4 regarding temporary or permanent engine replacement. The Division has developed specific alternative operating scenario language for either temporary or permanent engine replacement. The source may request to put such language in their permit. Note that the permanent engine replacement scenario does not apply to permit exempt or grandfathered engines.

The current permit and the draft renewal permit both specify that the source use manufacturer's emission factors (in units of g/hp-hr) to calculate emissions for purposes of APEN reporting. AP-42 emission factors have been revised since the original Title V permit was issued and therefore the Division converted the manufacturer's emission factors into units of lbs/mmBtu and compared them with the revised AP-42 emission factors. The manufacturer's emission factors were converted to lbs/mmBtu using the following equation and the design heat rates for the engines identified in the table below:

$$\text{EF (lbs/mmBtu)} = \frac{\text{EF (g/hp-hr)} \times 10^6 \text{ Btu/mmBtu}}{\text{Design heat rate (Btu/hp-hr)} \times 453.6 \text{ g/lb}}$$

| Unit | Design Heat Rate (Btu/hp-hr)[1] | Manufacturer's Converted Emission Factors (lbs/mmBtu) | | | AP-42 Emission Factors (lbs/mmBtu)[2] | | |
|---|---|---|---|---|---|---|---|
| | | $NO_X$ | CO | VOC | $NO_X$ | CO | VOC |
| P101 | 8500 | 4.15 | 3.63 | $2.6 \times 10^{-2}$ | 2.27 | 3.72 | $2.96 \times 10^{-2}$ |
| P102 | 8500 | 4.15 | 3.63 | $2.6 \times 10^{-2}$ | 2.27 | 3.72 | $2.96 \times 10^{-2}$ |
| P103 | 8333 | 4.23 | 3.7 | $2.64 \times 10^{-2}$ | 2.27 | 3.72 | $2.96 \times 10^{-2}$ |
| P301/302 | 7756 | 4.55 | 0.29 | $8.0 \times 10^{-3}$ | 2.27 | 3.72 | $2.96 \times 10^{-2}$ |

[1]From original Title V permit application submitted 3/1/1995
[2]AP-42, Section 3.2 (dated 7/00), Table 3.2-3 [($NO_X$ < 90% load), CO (90-105% load)]

The manufacturer's emission factors for units P101 thru P103 are higher than the AP-42 emission factors for $NO_X$ and slightly lower than AP-42 for CO and VOC. Typically it is the Division's policy to require portable monitoring for units that use emission factors less than AP-42 for $NO_X$ and/or CO. However, since the manufacturer's emission factors for CO for units P101 thru P103 are only slightly lower than AP-42 and since these units are exempt from permitting, the Division will not require portable monitoring in this particular case.

Note that no condition is included for the 30% opacity standard, which is applicable during certain operating activities. The specific activities under which the 30%

opacity standard applies are: building a new fire, cleaning of fire boxes, soot blowing, startup, any process modification, or adjustment or occasional cleaning of control equipment. Based on engineering judgment the Division considers that building a new fire, cleaning of fire boxes and soot-blowing does not apply to the operation of internal combustion engines. In addition, these engines do not have control devices, so adjustment or occasional cleaning of control devices do not apply to these units. Process modifications and startup may apply to engines, however, based on engineering judgment, the Division believes that such activities would be unlikely to occur for longer than six minutes. Therefore, the 30% opacity requirement has not been included in the operating permit.

Section II.2 – Units P301 and P302, Waukesha Engines (Electric Generators)

- Minor language changes were made to Condition 2.1 and an equation was included.

- Minor language changes were made to Condition 2.2.

- The opacity standard in Condition 2.3 and in the Table was rewritten to more closely resemble the language in Regulation No. 1. In addition, the word "credible" was added before "evidence".

- Under "monitoring interval" in the Table for Condition 2.3, replaced "annually" with "whenever natural gas is used as fuel".

- Removed Condition 2.4 regarding temporary or permanent engine replacement. The Division has developed specific alternative operating scenario language for either temporary or permanent engine replacement. The source may request to put such language in their permit. Note that the permanent engine replacement scenario does not apply to permit exempt or grandfathered engines.

The current permit and the draft renewal permit both specify that the source use manufacturer's emission factors (in units of g/hp-hr) to calculate emissions for purposes of APEN reporting. AP-42 emission factors have been revised since the original Title V permit was issued and therefore the Division converted the manufacturer's emission factors into units of lbs/mmBtu and compared them with the revised AP-42 emission factors. The converted emission factors and calculation methodology are discussed under Section II.1 above. The manufacturer's emission factor for $NO_X$ is more conservative than AP-42, while the manufacturer's emission factors for CO and VOC are much less conservative than AP-42. Since the source was unable to locate the manufacturer's data for these engines and since the manufacturer's emission factors for CO and VOC are much less conservative than AP-42, the source has requested to use the AP-42 emission factors for CO and VOC for these engines.

The current permit requires the source to calculate emissions using emission factors in units of g/hp-hr. AP-42 provides emission factors in units of lbs/mmBtu. The

Division presumes that the source would still prefer to use emission factors in units of g/hp-hr to calculate annual emissions. AP-42, Section 3.2 indicates that the lb/mmBtu emission factor can be converted to g/hp-hr by dividing by the maximum hp and multiplying by the design heat input of the engine. The AP-42 emission factors were converted to g/hp-hr, using the design heat rate of the engine as indicated in the table in Section II.1 above, in the following equation:

$$\text{EF (g/hp-hr)} = \frac{\text{EF (lb/mmBtu)} \times 453.6 \text{ g/lb} \times \text{Design heat rate (Btu/hp-hr)}}{10^6 \text{ Btu/mmBtu}}$$

The AP-42 emission factors that will be included in the permit are as follows: CO - 13.1 g/hp-hr and VOC – 0.1 g/hp-hr.

Note that no condition is included for the 30% opacity standard, which is applicable during certain operating activities. The specific activities under which the 30% opacity standard applies are: building a new fire, cleaning of fire boxes, soot blowing, startup, any process modification, or adjustment or occasional cleaning of control equipment. Based on engineering judgment the Division considers that building a new fire, cleaning of fire boxes and soot-blowing does not apply to the operation of internal combustion engines. In addition, these engines do not have control devices, so adjustment or occasional cleaning of control devices do not apply to these units. Process modifications and startup may apply to engines, however, based on engineering judgment, the Division believes that such activities would be unlikely to occur for longer than six minutes. Therefore, the 30% opacity requirement has not been included in the operating permit.

Section II.3 – Glycol Dehydration Unit

- Removed short term emission and throughput limits. Added the phrase “as modified under the provisions of Section I, Condition 1.3” after the construction permit citation in Condition 3.2 (gas throughput limits) to reflect that the underlying construction permit was modified to remove the short term limitations.

- Made minor language changes to Condition 3.1. Specifically, the requirement to conduct GLYCalc runs by the 5$^{th}$ day of the month was revised to allow until the end of the subsequent month. In addition, specified that GLYCalc Version 4.0 or higher is to be used to calculate emissions.

- Removed language regarding the gas analysis from Condition 3.1 and included it in a separate condition (new condition 3.3).

- Added a condition (3.4) to record days and hours of operation. Days of operation shall be used to determine the average daily natural gas throughput rate, which is used in GLYCalc. Hours of operation are an input to GLYCalc.

Section II.4 – Condensate Storage Tanks

As discussed previously, with recent revisions to Regulation No. 3 condensate storage tanks are no longer considered insignificant activities if VOC emissions are above the APEN de minimis level. The source submitted an APEN for the condensate storage tank battery for the facility indicating that VOC emissions are 11.7 tons/yr. Since VOC emissions are above the APEN de minimis levels, the condensate storage tank battery can no longer be considered an insignificant activity and has been included in Section II of the operating permit. The source will be required to calculate emissions annually using API Tanks Version 2.0 (flash emissions) and EPA TANKS version 4.0 (working and breathing losses). In order to estimate flash emissions, the source will be required to sample and analyze the condensate annually.

Section III – Permit Shield

- The citation in the permit shield was corrected. The reference to Part A, Section I.B.43 was changed to Part A, Section I.B.44 and the reference to Part C, Section XIII was changed to Part C, Section XIII.B.

- The title for Section 1 was changed from "Specific Conditions" to "Specific Non-Applicable Requirements" and a new section 3 was added for subsumed (streamlined) conditions. Note that there were no streamlined conditions.

- Based on comments made by EPA on another permit, the following statements were added after the introductory sentence in Section 1 "This shield does not protect the source from any violations that occurred prior to or at the time of permit issuance. In addition, this shield does not protect the source from any violations that occur as a result of any modification or reconstruction on which construction commenced prior to permit issuance".

- In their comments on the draft renewal permit the source indicated that they wished to add the requirements in 40 CFR Part 63 Subpart HH to the permit shield as a non-applicable requirement since the facility is a minor source with respect to HAP emissions.

Section IV – General Conditions

- Added an "and" between the Reg 3 and C.R.S. citations in General Condition 3 (compliance requirements).

- Added language from the Common Provisions (new condition 3). With this change the reference to "21.d" in Condition 20 (prompt deviation reporting) will be changed to "22.d", since the general conditions are renumbered with the addition of the Common Provisions.

- The citation in General Condition 7 (fees) was changed to cite the Colorado Revised Statue. In addition, any specific identification of a fee (i.e. $100 APEN fee) or citation of Reg 3 was removed and replaced with the language "…in accordance with the provisions of C.R.S. [appropriate citation]."

- The citation in General Condition 13 (odor) was corrected. In addition, the phrase “Part A” was added to the citation for Condition 13 (odor). Colorado Regulation No. 2 was revised and a Part B was added to address swine operations. Colorado Regulation No. 2, Part B should not be included as a general condition in the operating permit.

- The citation in General Condition 16 (open burning) was revised. The open burning requirements are no longer in Reg 1 but are in new Reg 9. In addition, changed the reference in the text from “Reg 1” to “Reg 9”.

- Added the requirements in Colorado Regulation No. 7, Section V.B (disposal of volatile organic compounds) to General Condition 28.

Appendices

- Removed the condensate storage tank (T-602, 16, 8000 gal) from the insignificant activity list in Appendix A.

- Added condensate loading equipment to the insignificant activity list in Appendix A.

- First Page of Appendices – The phrase “except as otherwise provided in the permit” was added after the word “enforceable” in the disclaimer at the request of EPA.

- Appendix B and C were replaced with revised appendices.

- The EPA addresses in Appendix D were corrected.